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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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EXAMINER	
ODOM, CURTIS B	
ART UNIT	**PAPER NUMBER**
2611	
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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/651,200	LEE ET AL.	
	Examiner	Art Unit	
	Curtis B. Odom	2611	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *20 February 2007*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-14,16,17,19,20 and 22-24* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☒ Claim(s) *10-14,16,17,19 and 20* is/are allowed.

6)☒ Claim(s) *1-9 and 24* is/are rejected.

7)☒ Claim(s) *22 and 23* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Response to Arguments

1. Applicant's arguments with respect to claims 1-14, 16, 17, 19, 20, and 22-24 have been considered but are moot in view of the new ground(s) of rejection.

Claim Rejections - 35 USC § 103

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

3. Claims 1, 2, and 4-8 are rejected under 35 U.S.C. 103(a) as being unpatentable over Miya (previously cited in Office Action 10/17/2006) in view of Iochi (US 2003/0058972).

Regarding claim 1, Miya discloses a method of detecting a random access channel (RACH) preamble in a received uplink signal from a user which is used to determine weighting (see section 0023), comprising:

spatially processing the uplink signal received at one or more antennas of a base station receiver (as shown in Fig. 5) by calculating weights based on a direction of arrival of the uplink signal (see section 0028-0029) and applying these weights to the received uplink base band signal through multipliers (see section 0037) and temporally processing an uplink signal received

at one or more receive antennas (AAA) as shown in Fig. 5 which contains data related to a random access channel (RACH) preamble (see section 0038), wherein the signal is temporally processed to detect the random access channel preamble, wherein the temporal processing includes:

calculating a detection level of a correlation peak (see section 0039) representing a decision statistic from the correlation calculation;

comparing the calculated detection level to a set threshold value (see section 0039); and

detecting a received random access channel (RACH) preamble if the detection level equals or exceeds the set threshold value (see section 0039).

However, Miya does not disclose specifically disclose the temporal processing to detect the random access channel preamble comprises:

temporally correlating the received uplink signal to output at least one subcorrelation output signal,

determining, for each subcorrelation output signal, a decision statistic as the magnitude squared of the subcorrelation output signal, and

comparing a maximum of the determined decision statistics to a threshold value the random access channel preamble of the uplink signal having been detected if the maximum decision statistic meets or exceeds the threshold value.

However, Iochi discloses temporal processing of a signal to detect a preamble signal comprising:

temporally correlating (see section 0046) the received uplink signal to output at least one subcorrelation (correlation values) output signal,

determining, for each subcorrelation output signal, a decision statistic as the magnitude (absolute value) squared of the subcorrelation output signal value (as described in section 0046), and

comparing a maximum of the determined decision statistics (correlation values) to a threshold value (see section 0054 and 0055),the random access channel preamble of the uplink signal having been detected if the maximum decision statistic meets or exceeds the threshold value (as described in section 0055).

Therefore, it would have been obvious to one skilled in the art at the time the invention was made to modify the temporal processing of Miya with the teachings of Iochi to detect a preamble since Iochi states this preamble detection method maintains the probability of preamble detection and probability of erroneous detection independently of the propagation environment (see section 0011).

Regarding claim 2, Miya discloses spatially processing the uplink signal in Fig. 5, elements 104-106 by calculating weights and applying these weights to the received uplink base band signal through multipliers prior to temporal processing by use of correlation in Fig. 5 section 108 (see Fig. 5).

Regarding claim 4, Iochi further discloses the received preamble (uplink) signal includes a cell-specific scrambling code used to determine the preamble (spatially processed signal), see section 0040). It would have been obvious to include this feature since Iochi states this preamble detection method maintains the probability of preamble detection and probability of erroneous detection independently of the propagation environment (see section 0011).

Regarding claim 5, Miya discloses the uplink signal includes time delays for directivity patterns for the channels (users) which are calculated in delay profiles (see sections 0031 and 0038). It is also the understanding of the Examiner that the received signal includes a Gaussian noise component, since white Gaussian noise comes from many natural sources such as antennas.

Regarding claim 6, Miya further discloses spatial processing includes multiplying the received uplink base band signal by a group of weights (W1) (see section 0037) which represent a weight vector to determine the spatially processed signal.

Regarding claim 7, Miya further discloses the group of weights are a function of the direction (angle) of arrival of the uplink signal with respect to the number of signals (users) received by the antennas (see section 0028), wherein the weights are a function of two or three antennas (see sections 0023-0024) which receive the uplink signal.

Regarding claim 8, Miya further discloses the received antennas are configured as a uniform linear adaptive antenna array (AAA), wherein the antennas are in a linear parallel configuration as shown Fig. 5 (see also sections 0002 and 0023).

4. Claim 3 is rejected under 35 U.S.C. 103(a) as being unpatentable over Miya (previously cited in Office Action 10/17/2006) in view of Iochi (US 2003/0058972) as applied to claim 1, and in further view of Branlund et al. (previously cited in Office Action 10/17/2006).

Regarding claim 3, Miya and Iochi do not disclose the received uplink signal is subject to temporal correlation prior to spatial processing of the temporally correlated signal.

However, Branlund et al. discloses a method of detecting a preamble in a communication system, comprising: subjecting an uplink signal (see sections 0008-0009) received at one or more

receive antennas of a base station and containing data related a preamble to temporal correlation by multiplying (correlating) the received preamble signal with a scrambling code (see section 0146) to output a signal representing a subcorrelated signal; and spatially processing the signal using a FFT (see section 0146) after temporal correlation which detects users in a given partition (direction) (see section 0150) to output a spatially processed signal, wherein the output of the FFT is used to detect the preambles (see section 0146). Therefore, it would have been obvious to one skilled in the art at the time the invention was made to provide temporal processing prior to spatial processing in Miya and Iochi as disclosed by Branlund et al. since Branlund et al. states detecting a preamble in this manner allows higher throughput on the transmission channel, which can reduce user latency (see section 0148).

5. Claim 9 is rejected under 35 U.S.C. 103(a) as being unpatentable over Miya (previously cited in Office Action 10/17/2006) in view of Pederson et al. (previously cited in Office Action 10/17/2006) and in further view of Iochi (US 2003/0058972).

Regarding claim 9, Miya discloses a method of detecting a random access channel (RACH) preamble in a received uplink signal which is used to determine weighting (see section 0023), comprising:

spatially processing the uplink signal by calculating weights based on a direction of arrival of the uplink signal (see section 0028-0029) and applying these weights to the received uplink base band signal through multipliers (see section 0037) and temporally processing an uplink signal received at one or more receive antennas (AAA) as shown in Fig. 5 which contains data related to a random access channel (RACH) preamble (see section 0038), wherein the signal is temporally processed to detect the random access channel preamble by correlating the RACH

preamble with already-known RACH preamble codes (see section 0038) and comparing the correlation (peaks) to a threshold to detect the receiver RACH preamble (see section 0039).

Miya does not disclose the detected random access channel preamble is indicative of the best cell portion for communicating with the user, wherein the best cell portion being a portion of a cell where a received uplink signal from the user has a highest signal to interference ratio or temporal processing to detect the random access channel preamble comprises:

temporally correlating the received uplink signal to output at least one subcorrelation output signal,

determining, for each subcorrelation output signal, a decision statistic as the magnitude squared of the subcorrelation output signal, and

comparing a maximum of the determined decision statistics to a threshold value

the random access channel preamble of the uplink signal having been detected if the maximum decision statistic meets or exceeds the threshold value.

However, Pedersen et al. discloses that before a base station (node B) can communicate with user equipment (UE), a best cell portion measurement representing a highest signal-to-interference ratio must be received from the user equipment (see section 0026). Pedersen et al. further discloses this measurement can be performed by introducing a new procedure on the random access channel (see section 0026). A measurement message can be sent for each cell portion. Therefore, it would have been obvious to one skilled in the art at the time the invention was made to modify the random access channel preamble of Miya to represent the best cell portion (measurement) for communicating with the user as disclosed by Pedersen et al. since

Pedersen et al. states a best cell portion measurement determines if a new link should be created with user equipment (see section 0026).

Iochi further discloses temporal processing of a signal to detect a preamble signal comprising:

temporally correlating (see section 0046) the received uplink signal to output at least one subcorrelation (correlation values) output signal,

determining, for each subcorrelation output signal, a decision statistic as the magnitude (absolute value) squared of the subcorrelation output signal value (as described in section 0046), and

comparing a maximum of the determined decision statistics (correlation values) to a threshold value (see section 0054 and 0055),the random access channel preamble of the uplink signal having been detected if the maximum decision statistic meets or exceeds the threshold value (as described in section 0055).

Therefore, it would have been obvious to one skilled in the art at the time the invention was made to modify the temporal processing of Miya and Pederson et al. with the teachings of Iochi to detect a preamble since Iochi states this preamble detection method maintains the probability of preamble detection and probability of erroneous detection independently of the propagation environment (see section 0011).

6. Claim 24 is rejected under 35 U.S.C. 103(a) as being unpatentable over Miya (previously cited in Office Action 10/17/2006) in view of Iochi (US 2003/0058972) as applied to claim 1, and in further view of Scott (U. S. Patent No. 6, 141, 373).

Regarding claim 24, Miya and Iochi do not disclose determining the threshold value so that as the number of antenna beams for a given angle of arrival of the received uplink signal increase, the threshold value increases so as to maintain a probability of false alarm over all antenna beams to a desired value, wherein the probability of false alarm is a probability that the uplink signal is falsely detected when no random access channel preamble have been transmitted by the user.

However, Scott discloses using a threshold to detect a preamble sequence, wherein the threshold is adjusted based on the received average sidelobe energy (see column 42, lines 15-38) from a number of antenna beams (as described in column 8, lines 21-51), the threshold is vaired to maintain a probability of false alarm over all antenna beams to a desired value (see Abstract) by rejecting the false alarms. Therefore, it would have been obvious to one skilled in the art at the time the invention was made to modify the preamble detection of Miya and Iochi with the threshold adjustment as disclosed by Scott since Scott states the threshold adjustment allows for better detection of the preamble at low signal levels (see column 43, lines 7-21).

Allowable Subject Matter

7. Claims 10-14, 16, 17, 19, and 20 are allowable over prior art references.

8. Claims 22 and 23 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Conclusion

9. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

10. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Curtis B. Odom whose telephone number is 571-272-3046. The examiner can normally be reached on Monday- Friday, 8-5.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jay Patel can be reached on 571-272-2988. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Curtis Odom
May 14, 2007

JAY K. PATEL
SUPERVISORY PATENT EXAMINER